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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,110	03/19/2004	Raghavendra JP Rao	SUNMP239/P9043/PS	8506

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EXAMINER

SCHNEIDER, JOSHUA D

ART UNIT	PAPER NUMBER
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2182

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/805,110	Applicant(s) RAO ET AL.	
	Examiner Joshua D. Schneider	Art Unit 2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-15 is/are allowed.
- 6) ☒ Claim(s) 17-21 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 16 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 16 recites the limitation "the first queue value" in the fifth line of the claim. There is insufficient antecedent basis for this limitation in the claim. It appears that the term should be the first queue threshold.

4. With regards to claim 21 it is unclear how a single queue can contain 4 different queues. This claim will be treated as if the four queues are all associated with a single port and not a single queue.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 17-21 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,617,365 to Binford et al.
7. With regards to claim 17, Binford teaches a first port providing access to a host requesting data (Fig. 2, element 250 and connections thereto), the first port having a first port

Art Unit: 2182

catch-up queue (Fig. 2, element 224), the first port catch-up queue configured to store Input/Output (I/O) transactions associated with read and write requests from the host (column 6, lines 59-32), an amount of I/O transactions posted to the first port catch-up queue at a time being controlled by a first port catch-up threshold (Fig. 4, element 408, column 9, lines 32-45); a second port providing access to the stored data (Fig. 2, elements 254, 256, and 258); a central processing unit (CPU) in communication with the first port and the second port (Fig. 2, elements 204, 206, and 208), the central processing unit configured to process the amount of I/O transactions per a single interrupt (column 9, lines 38-43); and a cache memory configured to store the stored data accessed through the second port (column 7, lines 41-44).

8. With regards to claim 18, Binford teaches the second port includes a second port catch-up queue (Fig. 2, element 214), the second port catch-up queue configured to store control data associated with retrieval of data requested by the host (column 7, lines 54-57), an amount of the control data posted to the second port catch-up queue at a time being controlled by a second port catch-up threshold (column 9, lines 8-10 and 38-43).

9. With regards to claim 19, Binford teaches the first port catch-up threshold is equal to the second port catch-up threshold (same embodiment can be applied to any of the queues includes variable values, column 9, lines 10-20).

10. With regards to claim 20, Binford teaches a main memory storing the first port catch-up threshold (column 9, lines 10-20 and 38-43).

11. With regards to claim 21, Binford teaches the first port (Fig. 2, element 202 connected to element 250) includes, a command queue (Fig. 2, element 224); a data transfer queue (Fig. 2,

Art Unit: 2182

element 226); a completion queue (Fig. 2, element 214); and a status queue (Fig. 2, element 216).

Allowable Subject Matter

12. Claims 1-15 are allowed.

13. Claim 16 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

14. The following is a statement of reasons for the indication of allowable subject matter: No teaching of setting a first catch-up threshold for accepting data requests from a first port, the first catch-up threshold corresponding to a number of requests collected from a first queue for each CPU interrupt, and adjusting the first catch-up threshold to reduce an imbalance between the number of requests made to the first queue and a number of requests made to a second queue during a time period, the second queue being configured to receive and store requests from the CPU to the first port; or teaching monitoring data being transferred between a front end port and a back end port through the CPU; determining whether a data transfer queue is running at an equivalent transfer rate as a command queue; and adjusting a catch-up threshold to reduce an imbalance between a number of writes to the command queue and a number of writes to the data transfer queue.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 7,111,301 to Johnson et al. teaches load balanced request and completion queue structure. U.S. Patent 6,421,723 to Tawil teaches setting a queue depth to avoid full status during operation.

Art Unit: 2182

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua D. Schneider whose telephone number is (571) 272-4158. The examiner can normally be reached on M, T, Th, and F, 9-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Huynh can be reached on (571) 272-4147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JDS



KIM HUYNH
SUPERVISORY PATENT EXAMINER

3/5/07